

5. The Commission Should Clarify Its Rules To Define The Consequences Of A Failure To Negotiate In Good Faith During The Mandatory Negotiation Period.

The Commission has sought comment on the "appropriate penalty to impose on [an incumbent] licensee that does not act in good faith" during the mandatory negotiation period.^{22/} STV believes that no "penalty" is appropriate at this time, although microwave incumbents, as Commission licensees, certainly are subject to appropriate forfeiture and license revocation orders that may become necessary if the Commission's continued efforts in this matter fail.^{23/} Rather, we support full-cost reimbursement to comparable and appropriately reliable facilities *even in the case of incumbents that negotiate in bad faith*. We propose, simply, that a PCS licensee should be permitted to file a petition for involuntary modification of the license of any incumbent that refuses to negotiate or negotiates in bad faith. This procedure would protect the needs of incumbents by ensuring that all will be subject to reliable and cost-free relocation; it also would protect the needs of PCS licensees by ensuring that all will be able to initiate service without being held up for years on end by bad-faith negotiating tactics of a few microwave incumbents.

The key issue is delay. STV submits that microwave incumbents should be required to respond promptly (within 45 days) to PCS licensee requests for relocation by providing complete and specific information about their needs for comparable facilities, considerations

^{22/} Notice, ¶ 69.

^{23/} The Commission either could craft such forfeitures on a case-by-case basis or, preferably, could adopt rules setting out specific forfeiture levels in this docket. *See United States Tel. Ass'n v. Federal Communications Comm'n*, 28 F.3d 1232 (D.C. Cir. 1994).

affecting engineering and frequency coordination, and costs. Some give-and-take between microwave users and PCS licensees will be necessary and probably should not be straight-jacketed at this stage by a rigid timetable.

But if the incumbent still has refused to accept the PCS licensee's offer of a full-cost and reliable relocation within 120 after the PCS licensee initiated the negotiation process in writing, the PCS licensee then should be permitted to file a relocation application on behalf of the recalcitrant microwave incumbent. This approach is consistent with the rules the Commission has adopted for the reclassification of incumbent microwave users to secondary status operation after the expiration of the appropriate period,^{24/} it is comparable to the procedures that the Commission has authorized in the case of proxy contests,^{25/} and it is similar to involuntary station-modification procedures utilized successfully in the MMDS and ITFS wireless cable services.^{26/} It is appropriate in these circumstances for similar reasons. Just as in the case of a petition at the end of the negotiation period, the PCS licensee will be required to demonstrate that it has pledged to reimburse all costs and provide the incumbent with reliable alternative facilities.^{27/} If the microwave incumbent has a complaint about the comparability of facilities, it can be resolved in this context. If the

^{24/} See 47 C.F.R. § 94.59(c) (1994).

^{25/} See, e.g., *Tender Offers and Proxy Statements*, 59 R.R.2d 1536, 1552 (1986); *Storer Communications v. Federal Communications Comm'n*, 763 F.2d 436, 443 (D.C. Cir. 1985).

^{26/} See Amendment of Parts 21, 43, 74, 78 and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands, Second Report and Order, 6 F.C.C. Rcd. 6792 (1991).

^{27/} See 47 C.F.R. § 94.59(c) (1994).

dispute concerns costs, it can be resolved without holding up the application and relocation process. Under this procedure, no incumbent licensee ever will be "penalized;" rather, incumbents that negotiate in bad faith will be relocated prior to the end of the negotiation period but at the full cost of the PCS licensee and with the full required guarantee of reliability.

II. WITH TWO EXCEPTIONS AND MINOR SUGGESTIONS FOR IMPROVEMENT, STV SUPPORTS THE COMMISSION'S DETAILED COST-SHARING PROPOSALS.

The Commission should promptly adopt effective mandatory cost-sharing procedures in order to resolve the "free rider" problem. Without a guarantee of reimbursement from other benefitting licensees, A and B block PCS licensees will not be able to provide the microwave incumbent community with systemic relocation solutions. Systemic relocations can cost three to five times more than the relocation of individual links, but can be, in the long run, more spectrum efficient, less costly and less disruptive.

This section addresses the carefully crafted cost-sharing proposals set forth in the *Notice*. First, it endorses a more precise system for determining when interference would occur and, therefore, cost-sharing is triggered than the TIA Bulletin 10-F methodology tentatively endorsed in the *Notice*. Second, it proposes a "soft" \$250,000 cap for relocation costs, rather than the seemingly rigid cap proposed in the *Notice*. Third, this section comments on various other components of the cost-sharing proposals set forth in the *Notice*.

In providing this input, STV emphasizes that it strongly endorses the thrust of the *Notice's* proposals and commends both the Commission and the industry for seeking

reasonable, fair and detailed solutions to the many practical problems posed by cost sharing as a necessary solution to the "free rider" problem. All three characteristics — reasonableness, fairness and specificity — are necessary to minimize controversy and delay.

In addition, STV stresses that its comments are based on extensive in-the-field experience. Specifically, it has negotiated with PrimeCo, AT&T, and GTE — other PCS licensees that will face these problems in myriad circumstances — a detailed cost sharing agreement which has worked out many of these same issues.^{28/} This experience, coupled with numerous microwave relocation negotiations, has provided highly practical insight into how these arrangements will actually work and what is truly fair and reasonable.

A. A "Proximity Threshold" System For Calculating Interference Should Be Adopted, Instead Of TIA Bulletin 10-F.

TIA Bulletin 10-F is not an appropriate standard for determining interference for the purpose of cost sharing or otherwise. First, it is subjective in that it allows for the use of different propagation models and alternative technical parameters. This subjectivity would inevitably lead to disputes among licensees and potentially before the Clearinghouse. *Notice*, paras. 62-65. Second, Bulletin 10-F calculations would have to be performed by the neutral, industry-supported Clearinghouse to maintain consistency. This, in turn, would significantly add to the cost of the Clearinghouse. Third, as indicated in the *Notice* itself, the Bulletin is controversial.

Instead, an interference standard for cost sharing should be adopted which allows for a clear "yes" or "no" determination, while reducing the engineering responsibilities of the

^{28/} See Attachment E.

Clearinghouse and, therefore, its cost. STV proposes the use of a "proximity threshold" system. Under such a system, an area would be identified around each path to be relocated. This calculation would then provide the basis for determining whether cost sharing is appropriate. This interference analysis system is used as the trigger in the attached STV, AT&T, PrimeCo, GTE cost-sharing plan.

The proximity threshold is a rectangle. The length of the rectangle is a line extending through both nodes of the microwave link to a distance of 30 miles beyond each node. The width of the rectangle is a line perpendicular to the microwave path extending 15 miles beyond each node. A diagram of this rectangle is provided on page 3 of the STV, AT&T, PrimeCo, GTE cost-sharing plan.

The proximity threshold concept

- allows for a clear "yes" or "no" determination of reimbursement responsibility, with little or no possibility for dispute;
- produces a very high probability that the microwave receiver in question would receive interference from any PCS base station located within the rectangle;
- assumes correctly that the number of base stations located within the rectangle that would not cause interference will statistically balance out those base stations outside the rectangle that would cause interference;
- equips the industry, the Clearinghouse and the Commission with a much easier and less expensive tool for determining when interference would be caused, thereby minimizing disputes, costs and delays; and
- enables future licensees more accurately to evaluate their reimbursement obligations.

Under the proposed system, once a proximity threshold is invaded, the reimbursing PCS licenses would be responsible for all co-channel paths within their licensed area that are a part of the original relocation agreement with the microwave incumbent. This would provide the PCS relocater with the incentive to negotiate systemic solutions. This system would also benefit subsequent PCS operators, for if the PCS relocater had not performed a systemic solution, then the next PCS licensee might confront the need for a systemic solution. Accordingly, there should be a requirement that all subsequent licensees provide systemic reimbursement to the PCS relocater. STV supports the PCIA proposal that only co-channel interference be eligible for cost sharing. Making adjacent-channel interference eligible would increase disputes, and the cost recovery for the PCS relocater would be insignificant, particularly since the PCS relocater would also be responsible for adjacent-channel reimbursement to other PCS licensees that negotiate for microwave relocation. Moreover, the proximity threshold trigger for reimbursement that STV endorses does not calculate adjacent-channel interference. The complexity that adding adjacent-channel considerations to the process is simply not warranted.

STV also proposes that the proximity threshold trigger should extend beyond licensed borders. Many current microwave paths extend beyond licensed PCS markets or run very close to borders. This proposal would not create an additional administrative burden for the Clearinghouse, since the proximity threshold rectangle is easy to administer and lends itself readily to outside-border analyses. It would also not create additional uncertainty for incoming licensees.

B. STV Supports The Proposed \$250,000 Cap, But Urges That It Be A Soft Cap.

The principle of a cap, covering costs plus (during the voluntary period) premium payments, is both fair and efficacious.^{29/} Setting this cap at \$250,000 (plus up to an additional \$150,000 for tower replacement) strikes a reasonable balance among various policy objectives, provided that it may be exceeded when actual relocation costs exceed \$250,000.^{30/} In this respect only, STV urges a slight but completely equitable modification to the proposal set forth in the *Notice* (§ 37).

Thus, if the PCS relocater paid \$280,000 to an incumbent for relocation, \$200,000 of which was for actual relocation costs and \$80,000 of which was a premium, then the PCS relocater would be entitled to reimbursement of \$250,000 and would have to absorb the excess \$30,000. But if the PCS relocater paid \$300,000 to an incumbent all of which was for actual relocation costs, then the PCS relocater would be entitled to reimbursement of the full \$300,000.

Costs for any features beyond comparable facilities should be considered a premium, except for an analog-to-digital upgrade, when, for engineering reasons, it is not possible to continue with analog facilities. In these cases, the costs of the digital system would be considered comparable replacement costs and, therefore, eligible for cost sharing. Expenses incurred prior to the adoption of cost-sharing rules should also be eligible. *Notice*, § 35.

^{29/} Documentation for all reimbursable costs would have to be provided to the Clearinghouse.

^{30/} One example is where multiple high-frequency paths are required to replace a single 2 GHz path.

C. Comments On Other Aspects Of The Commission's Cost-Sharing Proposal

The following paragraph-by-paragraph commentary on the Commission's cost-sharing proposals supports and in certain cases suggests fine-tuning of these proposals.

Cost-Sharing Formula (¶ 29). STV supports the proposed cost-sharing formula. A time-based formula is appropriate for achieving a level playing field for all PCS licensees. Licensees that are not first to market and did not participate in the original relocation negotiations with an incumbent should pay for a portion of the relocation costs depending on whether they would have caused interference to a relocated link. A formula that uses a monthly time basis is less tedious than a formula based on days, and more exact than a formula based on years.^{31/}

Date for T1 factor (¶ 30-31). STV agrees that the T1 factor^{32/} should be based on the date that the PCS relocater obtained its reimbursement rights, specifically, the date when the 2 GHz microwave path is decommissioned and, therefore, when the PCS licensee began to benefit from the relocation. The T1 variable should not be based on a fixed date, since it would be unfair to the PCS relocater to pay full price for a relocation that occurs three years from now, while a subsequent PCS licensee that activates an interfering base station one month later would make cost-sharing payments depreciated by three years.

^{31/} Fractions should be rounded to the nearest dollar figure using standard mathematical principles.

^{32/} T1 equals the month that the first PCS licensee obtained reimbursement rights.

Termination date (§ 39). STV agrees with the Commission that cost-sharing should cease on April 4, 2005, provided that all microwave licenses will convert automatically to secondary status on that date. Under this proposal, any PCS licensee triggering cost-sharing responsibility prior to April 4, 2005, would be responsible for appropriate reimbursement to the PCS relocater, based on the formula proposed by the Commission.

The Clearinghouse should be dissolved after the last PCS licensee with cost-sharing responsibility has paid in full. The latest date that a licensee could trigger cost sharing is April 3, 2005, and payment would be due to the PCS relocater shortly thereafter; the Clearinghouse could then dissolve. However, lingering disputes could extend its life, hopefully briefly.

Reimbursement rights (§ 46). STV supports the concept of "reimbursement rights" to be administered by the Clearinghouse. All PCS licensees activating base stations would be required, as proposed in the *Notice*, to file a prior coordination notice with the Clearinghouse that would be responsible for maintaining the database of relocated paths. If a new base station triggered a cost-sharing obligation, the Clearinghouse would notify the PCS licensee of its obligation to provide reimbursement.

Timing of reimbursement (§ 58). Reimbursement should not be required prior to commercial activation of the base station but should be due upon activation. If reimbursement is not made within ten days, the Commission should consider imposing

forfeitures and even requiring that it be shut down. After a violating licensee complied fully with its reimbursement responsibility,^{33/} the base station could be reactivated.

Installment payments by designated entities (§ 61). STV endorses the installment and interest proposals set forth in the *Notice* (§ 61) for PCS licensees that qualify as designated entities and, where appropriate, for UTAM.

Clearinghouse (§ 63). STV supports the not-for-profit Clearinghouse concept for administering the cost sharing plan. The Clearinghouse would not make engineering decisions (*e.g.*, calculating interference) and, therefore, would consist of only administrative personnel. Using the proximity threshold criterion described above, the Clearinghouse could easily determine reimbursement responsibility from the prior coordination notices it receives. Using the documentation supplied by PCS relocators, the Clearinghouse would calculate reimbursement requirements and notify subsequent PCS licensees of their responsibilities. Confined to these duties only, the Clearinghouse would be an effective and inexpensive mechanism for administering the cost-sharing process. The Clearinghouse should be funded by administrative fees from PCS relocators and subsequent PCS licensees.

Dispute resolution (§ 67). Disputes should first be brought before the Clearinghouse. If they cannot be resolved by the Clearinghouse, they should then be brought to alternative dispute resolution. STV's proposals, particularly for determining when interference would occur and for ignoring adjacent-channel interference, would significantly reduce the opportunity for dispute.

^{33/} All payments should include interest at prime plus 1 1/2 percent from the date they were due.

Voluntary Agreements Among PCS Licensees. As described earlier, STV is a party to a multiple-licensee agreement governing relocation cost-sharing. See Attachment F. Agreements such as this one promise to expedite the process of cost-sharing by permitting parties to voluntarily modify the procedures that may be used in connection with relocation cost-sharing. The Commission should clarify that voluntary contractual arrangements under which PCS licensees agree to share costs of microwave relocation under mechanisms that may differ from rules adopted by the Commission nonetheless will be valid.

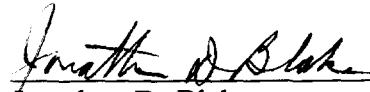
* * *

Because microwave relocation will determine the speed, cost and efficiency of the advent of a competitive PCS service in the United States, a matter in which the public has a very substantial stake, the Commission should promptly address the problems associated with the voluntary relocation process and adopt appropriate rules for cost-sharing of microwave relocations.

Respectfully submitted,

**SPRINT TELECOMMUNICATIONS
VENTURE**

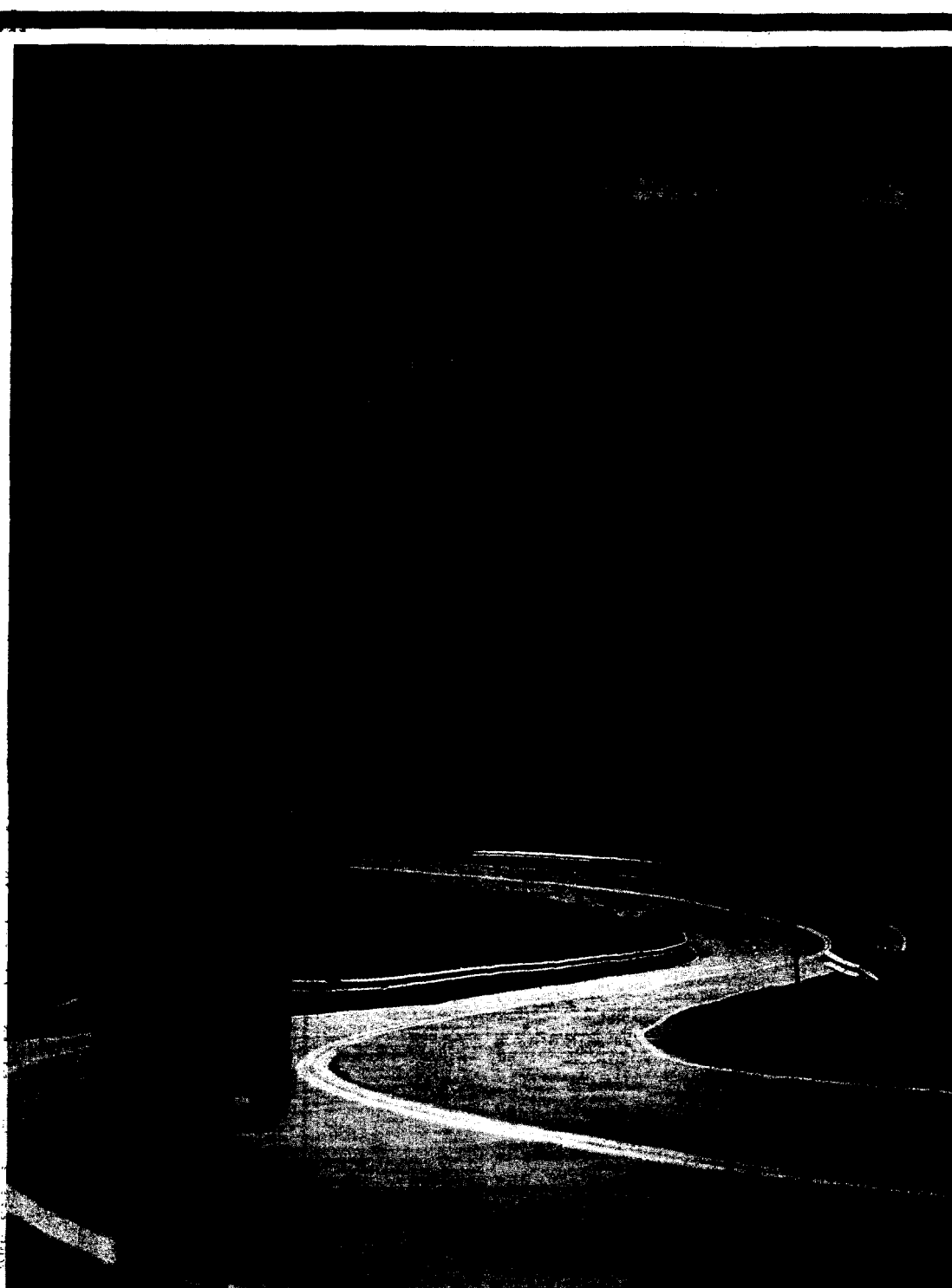
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Its Attorneys

November 30, 1995



Sure, Sprint wireless users can make calls from outside the greater Washington/Baltimore area.

They might want to have a quarter handy, though, because once they leave Sprint's very limited service area, their wireless phone can't make a call. So make sure the company you choose is Bell Atlantic NYNEX Mobile. With us, you can call to or from virtually anywhere in the country. And you can do so, knowing you have the backing and support of a leader. A leader in both technology and service who has been providing the people of this community with cellular service for over 11 years. For more information on Bell Atlantic NYNEX Mobile products and services, call **1-800-255-BELL**.

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A Mobile Services Joint Venture

Market Valuation

The Suffolk County marketplace contains a population of approximately 1.3 million people. Suffolk County is a key element in the lifestyle of the wireless customers in the New York BTA which contains a population of over 18.3 million people. The PCS industry authorities and service providers are projecting market penetrations of over 35% of this population within the next decade. Using current industry revenue projections ranging from current monthly revenues of \$55.00 per user to expected future monthly billings of \$ 45.00 per wireless user, these markets represent a potential revenue pool to be shared by the industry as illustrated below:

The Suffolk County Marketplace in Perspective

	Suffolk County MTA	New York BTA
Population	1,300,500	18,512,600
Customers projected	866,700	7,840,000
Revenue potential (at maturity)	\$ 39 million per month	\$ 353 million per month
Annualized revenues	\$ 467 million per year	\$ 4,236 million per year

Looking specifically to the market area immediately affected by the wireless airspace covered by the existing Suffolk County 2 GHz microwave system, the Suffolk County market area will be a highly valuable wireless marketplace due to the high profile income demographics of the county. Eighty percent of the Suffolk County marketplace population is found to be in the upper income strata that have historically formed the backbone of the cellular marketplace. Using penetration ratios comparable to national penetration models for these income sectors, Suffolk County offers a potential base of approximately 900,000 high income wireless users. The market at the eastern end of Long Island [The Hamptons] also serves to make Suffolk County a keystone in the market coverage area that will be required by the users in the metropolitan sectors of the New York BTA.

The projected revenues at risk through delayed entry into the Suffolk County marketplace are comprised of several factors:

- a. The loss of direct Suffolk County revenues
- b. The penalties of product and service attractiveness in the New York BTA marketplace without including Suffolk County as part of the active service area.
- c. Permanent loss in the New York BTA in the amount of 10 - 20 percentage points of the market share.

**Revenues at Risk for a Service Provider growing to
a 30 % Share of Market**

Revenues at risk	Suffolk County	New York BTA
Local market revenues in years 1 - 5	\$ 150 million	
Product disadvantages in the New Metropolitan market, (20%)		\$ 1,300 million at 20% = \$ 260 million
Projected revenue earned with 5 year early entry	\$ 143.9 million	\$ 1,300 million
Permanent loss of market share (10 % points) in years 6 -10	\$ 572 million cumulative in years 6 - 10 = \$57.2 million	\$ 5,106 million cumulative in years 6 -10 = \$ 510 million



Phone (202) 351-9
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November 21, 1994

IMPORTANT INFORMATION FOR ALL 2 GHz LICENSEES

Big Money and Your 2 GHz Microwave Band Relocation

Dear 2 GHz Licensees:

The Federal Communications Commission (FCC) has received 74 applications to participate in an auction, beginning December 5, 1994, of 99 Major Trading Area licenses to provide Personal Communications Services in the 2 GHz band (broadband PCS) on frequency blocks A and B.

As expected, the bidders for the MTA licenses include some of the largest telecommunications companies in the United States. Among those submitting applications were:

- Associated Vencap (Associated Communications)
- AT&T Wireless PCS Inc.
- Continental Cablevision, Inc.
- Radiofone Nationwide Paging Services, Inc.
- American Portable Telecommunications, Inc.
- WirelessCo, Limited Partnership (Consortium of Sprint, Comcast, Cox Communications and Telecommunications, Inc.)
- GTB Metro Communications Corporation
- PCS Princeps Limited Partnership (Consortium of Nynex, Bell Atlantic, US West and Air Touch)
- BellSouth Personal Communications, Inc.
- Concord Telephony Services II, Inc.
- Cox Cable Communications, Inc.
- Pacific Teleco Mobile Systems
- Southwestern Bell Mobile Systems, Inc.

I also wanted you to realize that 74 PCS providers:

- ☒ Are investing "big" money.
- ☒ Want their investments to work.
- ☒ May be the proud owners of your 2 GHz microwave license in the very near future.
- ☒ Are in a hurry to enter the market.

AND WHAT HAVE YOU DONE?

- ☒ Will you be ready for the transition?

IMPORTANT INFORMATION FOR ALL 2 GHZ LICENSEES

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These applicants were required to submit their upfront payment for the December 5 auction by Friday, November 18, 1994.

For example, the upfront payment by a PCS provider for the following four Major Trading Areas, consisting of either one or two 30 MHz MTA Frequency blocks, amounted to:

<u>Market No.</u>	<u>Major Trading Area</u>	<u>Population</u>	<u>Upfront Payment</u>	<u>Block(s)</u>
M-1	New York	26,410,347	\$ 15,846,359	B Only
M-3	Chicago	12,069,700	\$ 7,241,820	A & B
M-10	Washington-Baltimore	7,777,875	\$ 4,666,725	B Only
M-34	Kansas City	2,913,304	\$ 1,747,993	A & B

* Upfront Payment = Population x Block Size in MHz x \$.02

The upfront payment is small compared to the "big money" the successful bidder will have to pay for a PCS license in the December 5, 1994 auction.

Money issues are always interesting and intriguing. Following is an example of the amount of investment which might be made by a PCS provider for the Major Trading Area No. 10, Washington-Baltimore:

Market No: 10
Major Trading Area: Washington-Baltimore
Upfront Payment: \$ 4,666,725

Interest otherwise earned on upfront payment:

6% YEARLY INTEREST RATE OTHERWISE EARNED: \$ 373,300
 6% MONTHLY INTEREST RATE OTHERWISE EARNED: \$ 31,100

Possible Auction \$752,000,000
Bidding Price for MTA No. 10 due and payable 5 days after the license has been awarded.

Interest otherwise earned on auction investment:

6% YEARLY INTEREST RATE OTHERWISE EARNED: \$ 60,160,000
 6% MONTHLY INTEREST RATE OTHERWISE EARNED: \$ 5,000,000

IMPORTANT INFORMATION FOR ALL 2 GHz LICENSEES

Page 3

Marketing issues are also very interesting. Now that we have learned how the PCS provider who invested in the Washington-Baltimore License Block B could receive, conservatively speaking, a monthly interest of — WOW! — \$5,000,000 on his auction investment, we can determine without a doubt that the PCS provider will be most anxious to enter the PCS market in a hurry to recoup its investment. The PCS provider needs to enter the market the minute he has been issued the 2 GHz license. *The PCS provider cannot afford to lose \$5,000,000 per month and more, especially since he will have to spend millions or even billions more to build his network.*

NOW THE MOST IMPORTANT QUESTION, YOU THE 2 GHz LICENSEE SHOULD ASK:

"What have I done to be ready for the transition?"

Over the past several months we have suggested that you plan early. We asked you to address crucial decisions about your relocation, such as:

- Where to go?
- What should the compensation package include?
- What negotiation strategy should I employ?

Are you prepared to accomplish this major transition task alone? If not, UTC Service Corporation and its Transition Team can assist you.

Call us today toll-free at 1-800-900-4882 and find out how we can assist you in relocating from the 2 GHz band.

Sincerely,



Trudy Richmond
Marketing and Sales Manager

STANFORD UNIVERSITY
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September 1, 1995

To Whom It May Concern:

I have been asked by Pacific Bell to estimate two kinds of losses that the government and consumers may suffer as a result of the current rules governing microwave relocation. The first is the loss of revenue to the Treasury in auctions for the C, D, E, and F-band PCS licenses resulting from the demands by microwave licensees for premium payments before relocating microwave links. Recent demands from microwave incumbents have called for payments of \$1 million per link, compared to an estimated actual relocation cost of \$200,000 for an average link. Such demands directly reduce the value of the PCS licenses to potential buyers. If recent demands are a fair indication of eventual settlements and if premium costs are shared equally among affected PCS providers, the loss of auction revenues would amount to \$1.9 billion. Smaller demands or compromise settlements could halve the cost to about \$900 million.

The second kind of loss is that suffered by consumers as a result of delays in initiating PCS services. The current rules encourage microwave users to utilize threats of delay to increase their bargaining power, since delays are costless to them but costly to the PCS providers. The loss in consumer surplus from delaying the introduction of PCS services on the A and B bands nationwide, conservatively estimated, amounts to \$55 million per month of delay, while the loss of delays in introducing services in the C band amounts to at least \$11 million per month. Under less conservative estimates, the costs could be several times higher than this.

Additional background for these calculations are provided in the attached statement.

Respectfully submitted,


Sincerely yours,

Statement of Paul R. Milgrom

1. My name is Paul R. Milgrom. I am the Shirley and Leonard Ely, Jr. Professor of Humanities and Sciences and Professor of Economics at Stanford University in Stanford, California, 94305.

2. I received an A.B. degree in Mathematics from the University of Michigan and an M.S. in Statistics and a Ph.D. in Business from Stanford University. My academic specialty is microeconomic theory and comparative economic institutions. From 1990-1994, I was coeditor of the *American Economic Review*. I have also served on the editorial boards of several other economics journals. I am the author of more than sixty books and articles and have been the recipient of numerous awards and honors, including Fellowships in the American Academy of Arts and Sciences and the Econometric Society. I have also received Fellowship grants from the John Simon Guggenheim Foundation, the Center for Advanced Study in the Behavioral Sciences, and the Center for Advanced Studies in Jerusalem. My curriculum vitae is attached.

3. I have devoted considerable time and attention to telecommunications issues, especially once concerning Personal Communications Services (PCS). Since November of 1993, I have filed nine affidavits or statements with the Federal Communications Commission regarding PCS-related matters, including two that were co-authored with my colleague, Stanford Professor Robert Wilson. I acted as an adviser to Pacific Telesis Mobile Services during the recently completed auction #4 of broadband PCS licenses. In 1994, I filed an affidavit in connection with the motion to terminate the MFJ. In 1984, when the MFJ precipitated a restructuring of certain contracts between AT&T and the Southern New England Telephone Company (SNET), I advised SNET about the renegotiation of its contracts.

4. My other experience with regulatory matters is diverse. It includes testimony given to the Federal Energy Regulatory Commission concerning pricing on the Trans-Alaska pipeline, testimony at trial concerning the economics of the insurance contracting, and written testimony concerning environmental regulation filed with the National Oceanographic and Atmospheric Administration (NOAA).

5. I have been asked by Pacific Telebits Mobile Services (PTMS), the high bidder in auction #4 for the B-band licenses covering the Los Angeles and San Francisco MTAs, to comment on the likely costs to consumers and the government resulting from bargaining with microwave licensees whose operations would suffer interference from PCS operations. These costs include reductions in future government auction revenues and probably also include reductions in consumer surplus resulting from delays in the introduction of PCS services.

6. Any such calculations necessarily rest on a forecast of the outcome of bargaining between the PCS providers and the microwave licensees. Data about PCS providers willingness to pay and bargaining postures are confidential and unavailable, so I have had to rely on information about the microwave providers initial demands. A second estimation issue arises from the fact that most existing microwave links are vulnerable to interference from more than one PCS frequency. In those situations, my estimate of the revenue impact on future auctions will depend on how the costs of relocating microwave links will be apportioned among the interfering operations. For these calculations, I have assumed that where multiple services would interfere with a link, my payments to microwave licensees are shared equally among interfering service providers.

Summary

7. In my opinion, the losses associated with any delay in beginning PCS services caused by negotiations between point to point microwave users and PCS licensees would be very large. The financial demands of microwave users reduce the attractiveness of PCS licenses yet to be auctioned. If the recent demands made by microwave licensees are representative of bargaining outcomes, losses in government auction revenues from sales of the C, D, E, and F-bands as a result of payments to microwave users would total between \$930 million and \$1.9 billion. Delays in delivering PCS service as a result of protracted bargaining are likewise costly. I measure these costs in terms of the loss of consumer surplus resulting in a one-month delay in the service initiation for all licensees in the A and B bands or in the C band. Using the most conservative estimation procedure, losses in consumer surplus accrue at a rate of \$55 million per month of delay for the A and B-band services, and \$11 million per month for the C-band service. Less conservative, but